

**Lab Test**

New competency tests are helping get more research out of the high-resolution microscopes in Bldg. 31. Story on Page 3.



**Video field trip**

About 10,000 youngsters visited JSC over the past two weeks for a video field trip to the bottom of the ocean. Photo on Page 4.

# Space News Roundup

Vol. 32

March 15, 1993

No. 10

## Goldin's pledge: working space station by 2000

Administrator says NASA programs must be more relevant to Americans

By Kelly Humphries

NASA Administrator Daniel Goldin said Wednesday that he has pledged the agency to produce an operational space station for less money by the year 2000, and challenged NASA employees to work as a team to get the job done.

NASA will have to change its focus from building a space transportation infrastructure to developing dual-purpose cutting-edge technolo-

gies that can improve the lives of Americans while preserving its core program of exploration and science, Goldin told the American Astronautical Society-Goddard Memorial Symposium in Arlington, Va.

The speech came on the first day of formal meetings of the Space Station Redesign Team headed by Assistant Deputy Administrator Joseph Shea with participation from top agency managers, center direc-

tors, congressional leaders and international partners.

Goldin said a new station design that incorporates a shorter life span and drastically reduces the number of shuttle flights and space walks required for assembly will be delivered to President Clinton.

The orbiting laboratory, providing new insights into gravity's role in physical, chemical, biological and human physiological processes, will

retain its international character with participation from the European Space Agency, Japan and Canada.

Goldin said some companies will have a different role in the space station project, with some "finite dislocation" that will in the end create additional opportunities by freeing up funds to concentrate on demanding new missions that drive cutting technology.

"We have to contribute to the

deficit reduction and when the President releases his budget in April, you will see that we are going to do just that. We can expect no less and we should do no less," Goldin said. "We have to seek a new level of relevance. We have to make our work meaningful to the American people and we have to justify it every single day."

Goldin asked NASA employees to Please see **GOLDIN**, Page 4

## Cohen shares NASA outlook with employees

NASA—and all other agencies, for that matter—is under the gun to produce what it promises on schedule and at the projected cost in today's tight financial climate, JSC Director Aaron Cohen said last week.

Cohen presented his "realistic" look at what national leaders and the Washington climate hold in store for the space agency and JSC to senior staff and division chiefs on March 5. He plans to share his perceptions with a broad cross-section of employees in small groups during the coming weeks.

The employees who are asked to attend these meetings will be chosen by the leadership of their organizations. Each organization at JSC will be represented proportionately, with larger organizations able to invite more employees, but every major office will be able to send at least one representative.

Those asked to attend will be invited to ask questions of Cohen during the meeting, and will be expected to share the discussions with their coworkers afterward.

Cohen's reflections follow a lengthy tour of duty as acting deputy administrator for the agency—he still holds that title today—and his participation in recent congressional hearings on Space Station *Freedom*.

"For JSC and NASA to be successful, we have to hold to costs," Cohen said. "Congress is not going to accept cost growth today, whatever the cause."

Cohen said this attitude is a change from past programs such as Apollo and the space shuttle, and may make things more difficult for young project managers. During earlier programs, Congress would accept reasonable cost growth if the agency could provide sufficient justification. But those days are gone, he said.

The program that has helped the Please see **COHEN**, Page 4



JSC Photo by Andrew Patnesky

Members of the STS-60 crew, from left Commander Charlie Bolden, Russian Astronauts Sergei Krikalev and Vladimir Titov, an interpreter, and Pilot Ken Reightler discuss their upcoming mission with the news media in Bldg. 2.

## Russian astronauts see similarities

By Billie Deason

The two Russian astronauts who are training for the upcoming STS-60 mission said Tuesday that they see similarities in the challenges facing the American and Russian space programs, and that tight budgets may force the two space powers to cooperate on a space station.

"The same problems are facing both station programs," Sergei Krikalev said through an interpreter. "I think there is a lot of redundancy. Money is spent developing the same systems both here and there."

The two Russians, who are training for the upcoming STS-60 mission, met the news media on Tuesday. Krikalev and Col. Vladimir Titov, both veteran cosmonauts, discussed their training at JSC—under way since November—and their families' adaptation to living in a different culture. Within a few weeks, the Russian Space Agency is expected to decide which one will fly on STS-60.

Krikalev and Titov said the Russian and NASA training programs are similar.

"I would say that the biggest challenge during this time is the study of the English language," Krikalev said through an interpreter.

"I would join in that statement," Titov

agreed. "The second challenge is the NASA language. NASA has about 300-pages containing all kinds of acronyms which we are trying to grasp."

Both Russians are being trained as mission specialists and will have the same set of duties any American astronaut mission specialist would be assigned on a flight. Among those jobs, the Russian astronaut will handle *Discovery's* robot arm for the retrieval and berthing of the Wake Shield Facility, a 12-foot diameter satellite developed by JSC and the University of Houston's Space Epitaxy Center.

The Wake Shield Facility experiment will be deployed with the robot arm by NASA Astronaut Jan Davis and will remain free-flying in space for approximately 48 hours. While deployed, the free flyer will create a wake that will produce a high vacuum. Molecular Beam Epitaxy processing equipment will be used to grow extremely pure thin film crystals for industrial uses.

The Russian mission specialist also will serve with mission commander Charles Bolden as the in-flight-maintenance technician if any crew-repairable equipment should malfunction during the mission.

The STS-60 mission is scheduled for November 1993.

## Hydraulic hoses OK'd; Columbia back on track

By James Hartsfield

After a hydraulic hose in the engine compartment ruptured late last week, *Columbia* is now back on track with launch preparations moving toward a normal schedule for STS-55.

As of Thursday, an official launch date for *Columbia* had not been set pending the resolution of a conflict with expendable rockets scheduled to launch around the same time. Still, *Columbia* could mechanically be ready to launch as early as March 19.

An analysis of the hose, which broke during a standard flight readiness test of the main engines, found that a brief procedural change in manufacturing of the hoses that occurred during four months in 1977 at the supplier's factory had weakened it. A different type of buffing wheel had been used during that period to remove the outer insulation from the end of the hoses. The buffing wheel, which exposed the wire braid to allow end fittings to be attached, had damaged the braid and weakened the hoses.

On *Columbia*, 10 hoses including the ruptured hose, were found to have been made during that time frame. All of them were being used in the hydraulic system that retracts the line connecting the spacecraft to the external fuel tank after the main engines are cut off. Although the wire braid was damaged on all of the hoses, they passed proof tests that pressurized them to twice the amount of pressure they normally carry after being removed from *Columbia*.

As a precaution, all of the high-pressure hoses in question were replaced this past week using spares and hoses removed from *Atlantis*. Three hoses made during that time frame were in an area that carried a much lower pressure and they were reinstalled.

The nine-day Spacelab D-2 mission, led by Commander Steve Nagel and Payload Commander Jerry Ross, will include some 90 experiments that will study fluid physics and human physiological changes in microgravity, the Earth's atmosphere and its topography, galactic astronomy and technology development.

Elsewhere, *Discovery* was scheduled to move to Launch Pad 39B on Saturday in preparation for a launch on STS-56 in early April. And *Endeavour* remains on track for a launch on STS-57 in early May.



John Casper

## Two 1994 crews picked

Casper to command STS-62, Gutierrez STS-59

By Barbara Schwartz

NASA has named the crews of STS-62 and STS-59, two space shuttle missions scheduled for launch in early 1994.

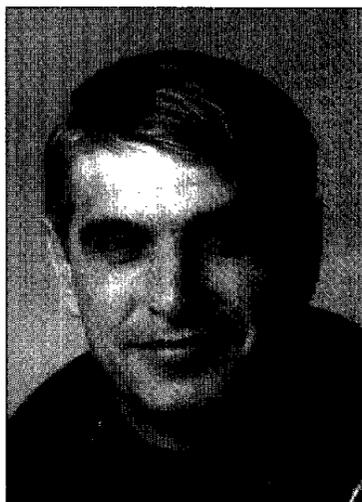
Air Force Col. John H. Casper will command the STS-62 mission with the second U.S. Microgravity Payload and the second Office of Space and Terrestrial Applications payload aboard *Columbia*.

Other crew members are Marine Corps Maj. Andrew M. Allen as pilot and Navy Cdr. Pierre J. Thuot, Army Lt. Col. Charles D. "Sam" Gemar and Marsha S. Ivins as mis-

sion specialists.

Experiments on STS-62, a 13-day extended duration orbiter mission, include growing crystals of semiconductor materials; investigating the properties of xenon during phase transitions, investigating the fundamental behavior of materials as they solidify into structures known as dendrites and monitoring equipment that will measure and record disturbances in the microgravity environment of the USMP carrier. These experiments allow the scientific and commercial com-

Please see **CREWS**, Page 4



Sidney Gutierrez

## Astronaut Jemison to teach, be mentor

Astronaut Mae C. Jemison, M.D., left NASA on March 8 to pursue interests in "teaching, mentoring, health care issues and increasing participation in science and technology of those who have traditionally been left out."

"I leave with the honor of having been the first woman of color in space, and with an appreciation of NASA—the organization that gave me the opportunity to make one of my dreams possible," she said. "The experiences of the NASA astronaut program have opened many doors, and provided a way to put my hard

Please see **JEMISON**, Page 4

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# Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Gift Store from 10 a.m.-2 p.m. weekdays. For more information, call x35350 or x30990.

**Astroworld Early Bird Special** — Tickets purchased before May 31 and used before June 30 at \$15.95.

**Fiesta Texas, San Antonio** — Discount tickets: adult, \$18.35; child (4-11) \$12.75. **Space Center Houston** — Discount tickets: adult, \$7.50; child (3-11) \$4.50; commemorative: \$8.75.

**Metro tickets** — Passes, books and single tickets available.

**Movie discounts** — General Cinema, \$4.50; AMC Theater, \$3.75; Loews Theater, \$4.

**Entertainment '93 and Gold C coupon books, stamps, Walt Disney Club memberships, business cards, stamps and souvenirs** also available.

**Upcoming events:** Walt Disney on Ice, March 27; NASA Night at Astroworld, April 2; Galveston Home Tours, May 1, 2, 8 and 9.

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# Gilruth Center News

**EAA badges** — Dependents and spouses may apply for photo identification badges from 6:30-9 p.m. Monday through Friday. Dependents must be between 16 and 23 years old.

**Defensive driving** — Course is offered from 8 a.m.-4:30 p.m. April 17. Cost is \$19.

**Weight Safety** — Required course for employees wishing to use the Gilruth weight room is offered from 8-9:30 p.m. March 25. Pre-registration is required; cost is \$5.

**Aerobics** — High/low-impact classes meet from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is \$32 for eight weeks.

**Exercise** — Low-impact class meets from 5:15-6:15 p.m. Mondays and Wednesdays. Cost is \$24 for eight weeks.

**Aikido** — Martial arts class meets Tuesdays from 6:15-8 p.m. Cost is \$15 per month.

**Scuba** — Four-week session meets Tuesdays and Thursdays beginning March 25 at the Gilruth Center. Total cost is \$190, with \$50 paid at registration.

**Fiction workshop** — Five-week creative writing class meets Wednesdays beginning March 31. Cost is \$80.

**Softball tournament** — The Pre-season Men's Open C Softball Tournament will be March 27-28 at the Gilruth. Entry deadline is 7 p.m. March 25; cost is \$95 per team.

**Softball sign-ups** — Openings are available for softball teams to sign up in the mixed C recreational, men's C, men's A and men's over 40 leagues. Call x30304 for more information.

**Fitness program** — Health Related Fitness Program includes medical examination screening, 12-week individually prescribed exercise program. Call Larry Weir, x30301.

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# Swap Shop

Swap Shop ads are accepted from current and retired NASA civil service employees and on-site contractor employees. Each ad must be submitted on a separate full-sized, revised JSC Form 1452. Deadline is 5 p.m. every Friday, two weeks before the desired date of publication. Ads may be run only once. Send ads to Roundup Swap Shop, Code AP3, or deliver them to the deposit box outside Rm. 147 in Bldg. 2. No phone or fax ads accepted.

## Property

**Sale:** Dickinson, 4-3-2D, study, game rm, screened porch, lg kitchen w/Jennaire, new ceramic tile, util rm inside, lot w/trees, \$129.9K. Coy, x39282 or 335-0641.

**Sale:** Dickinson Bayou, waterfront, 4-2.5-2, pool, 100 yr old trees, sec sys, FPL, wetbar, \$225K. x34354 or 337-1640.

**Sale:** Friendswood, 4-2-3 or 3 BR w/game rm, 3/4 acre, trees, study, family living, screened patio, monitored sec sys, storage, \$238K. 333-6045 or 992-1338.

**Sale:** Bay Glen, 3-2-2, less than 3 yrs old, upgrades, \$107K. x32987 or 480-1387.

**Sale:** LaPorte, 3-2-2, pool, fenced w/decking, tile, fans, ex cond, \$75K. x33433 or 471-6175.

**Rent:** Near NASA, efficiency. Don, x30517 or 532-1361.

**Rent:** Lake Travis cabin, CA/H, fully equipped, accommodates 8, fall & winter, \$325/90, wkly/daily. 474-4922.

**Rent:** Winter Park, CO, condo, 2 BR, sleeps 6, furn, \$120/night. 488-4453.

**Rent:** Cancun, Mexico, cond, 2 BR, sleeps 8, avail anytime, \$500/wk. Katie, x33185.

**Rent:** Galv beach house, furn, cent air, day/wk. Ed Shumilak, x37686 or 326-4795.

**Sale:** LC, waterfront property, 61.5' x 313' deep, thermometer inlet, \$99K. 332-5020.

**Sale:** South Shore Harbour, 3-2-2, island kitchen w/breakfast rm, lg living areas, custom deck w/ceiling fan, marble jacuzzi tub, trees, \$113.9K. Bob, x33057 or 538-3431.

**Sale/Lease:** Heritage Park, 3-2-2, cul-de-sac, lg fenced backyard, new carpet/minibinds, \$61.5K or \$750/mo + dep. 326-5216.

**Rent:** Webster, 2-1 W/D conn, sec gate, trash pickup, alarm sys, \$550/mo. 486-6011.

**Sale:** El Dorado Trace condo, 1-1.5-1cp, all appl, patio, balcony, FPL, fans, designer carpets/wallpaper, low equity assum or FHA approved. Barbara, 488-3833.

**Sale:** Bay Glen, 3-2-2, corner lot, 3 yrs old, approx 1700 sq ft, less than 1000 sq ft, \$117.9K. 283-1094 or 286-7305.

**Lease/Sale:** CLC, Baywind I, 2-1-5, fans, W/D, pool, game rm, new paint, carpet, no pets, \$525/mo. 326-1944.

**Rent:** Arkansas cottage, furn, wooded, 4 acres, screened porch, antiques, \$250/wk, \$50/day. x33005 or 538-4141.

**Sale:** Bayou Vista lot, bulkhead, waterfront, \$4.5K. 339-1957.

**Lease:** Friendswood/Wedgewood, 3-2.5-2, lg living rm, patio, trees, fenced, FPL, no pets, \$750/mo. 482-6609.

**Rent:** Galv condo, furn, sleeps 6, Seawall Blvd & 61st, cable, wknd/wkly/daily. Magdi Yassa, 333-4760 or 486-0788.

**Rent:** Pearland, 3-2-2, avail 4-1-93, \$700/mo., \$500 dep. 480-9036.

**Sale/Rent:** Waterview condo or TH, all forms, boatslip, 2 FPL's, all amenities,

\$895/1275, all bills paid, S.P. \$69/75K. 326-2221 or 280-2506.

## Cars & Trucks

'90 GEO Metro, 4 DR, AM/FM, 5 spd, \$3.6K OBO. Mandy, 283-5779 or 480-1236.

'85 Honda Accord hatchback, auto, 86K mi, AC, new tires, stereo, need some body work, ex eng, \$2.5K OBO. Beth, x33078.

'86.5 King Cab 4 x 4 Nissan PU, blk, AM/FM/cass, tint, ex cond, \$6K; '59 Chevy PU for parts or restoration. 334-2335.

'91 T-Bird Super Coupe, wht, leather, all pwr, ABS, JBL, sound, warr, sunroof, 9K mi., \$17K OBO. 286-3981.

'87 Ford Escort GT, silver/blk, new tires, 5 spd, 2.8 HO elec fuel injection, super sound, ex cond, \$2.1K. Thelma, x56221 or 436-9916.

'78 Porsche 928, brwn w/leather int, auto, 75k mi, ex cond, \$8.5K. Bill, 244-8889.

'82 Datsun, 2 DR, air, new tires, fair to good cond, \$1.1K. x333-7131 or 334-1009.

'84 Nissan 300ZX, 5 spd, 95K mi, t-tops, AC, AM/FM/cass, PW/PL, ex cond, \$3950 OBO. Nelson, 282-5229 or 334-1008.

'88 Acura Integra LS, 5 DR, 68K mi, auto, AC, AM/FM/cass, all pwr, all main records, ex cond, \$6950 OBO. Perri, x32605 or 334-1008.

'86 3/4 ton GMC Suburban, 69K mi, Silverado package, \$6.5K. Tom, 282-4638 or 332-6184.

'84 Dodge Ram SE window van, 88K mi, good cond, \$3.5K. x45829 or 326-4387.

Chevy Astro bucket seats, \$70/pr, Class II trlr hitch/receiver, \$70; 7' octagonal hot tub cover, \$100. Wayne, 244-7570.

'82 Corvette, glass mirrored t-tops, low miles, \$8K OBO. 474-3430.

'86 Nissan Stanza wagon, tune up, storage, \$3K. 996-5191.

'84 Pontiac LE6000, wht, new tires, AC needs work, \$1.9K. x36604 or 482-7156.

'79 Datsun 280ZX, new paint, 92K mi, \$2.2K. x32458 or 333-9518.

'78 Chevy Malibu wagon, 75K mi, 305 V8 eng, body, cold AC, int, all in good cond, \$895. x35180 or 326-3706.

'84 Toyota Tercel, auto, AC, 67K mi, ex cond, \$1.9K. x38518 or 332-4366.

'78 Mercury Cougar, runs good, \$650. x38978 or 409-925-5230.

'90 Toyota 4-Runner, 4 DR, auto, 2 wheel drive, 4 cyl, air, AM/FM/cass, \$14K. 244-9750 or 541-2862.

'86 Toyota Supra, sunroof, 5 spd, perf pkg, 60K mi, ex cond, \$6.5K OBO. Bob Adams, x32567 or 488-3314.

'84 Chrysler 5th Ave, 63K mi, ex cond, \$4.2K. Elaine Stemerick, 326-2402.

'90 Ford Escort, 4 DR hatchback, air, AM/FM/cass, auto, pwr steering, good cond, 43K mi, \$6.5K OBO. Mary Beth, x30439 or 286-7388.

'91 Ford Escort LX, 4 DR hatchback, AC, 5 spd, cruise, alarm, PS/PB, pwr mirrors, cass, tint, 25K mi, \$6.3K negotiable. x39461 or 729-2006.

'86 Hyundai Excel, well maintained, AC, AM/FM/cass, 2 DR, hatchback, clean eng, nonsmoker, \$1.2K OBO. 270-5627.

'77 Sedan deVille, new paint/vinyl top, leather int, new tires, AC comp, detailed in/out, 124K mi, ex cond, \$2K. Jim L, x33627 or 729-2774.

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# Dates & Data

## Today

**Call for papers** — The American Institute of Aeronautics and Astronautics Houston Section is seeking papers for its 18th annual Technical Symposium, to be hosted by the University of Houston-Clear Lake in mid-May. Abstracts of 250 words or less and a completed NASA Form FF427 are due by March 15 to Dick Bennett, MDC/314CA, 16055 Space Center Blvd., Houston, 77062. For more information, call 283-1956.

**Cafeteria menu** — Special: Italian cutlet. Entrees: braised beef ribs, chicken a la king, enchiladas with chili. Soup: cream of broccoli. Vegetables: navy beans, Brussels sprouts, whipped potatoes.

## Tuesday

**NCMA seminar** — The Space City Houston Chapter of the National Contract Management Association will host its 1993 National Education Seminar on March 16 at the University of Houston-Clear Lake. The topic will be "Financial Issues for the Contracts Professional." For more information, government employees should call Jeff Cullen at x31880. Others should call Sherri Wagner at 283-4660.

**Blood drive** — Hernandez Engineering will host a blood drive from 8:30-11:30 a.m. March 16 in the parking lot at 17625 El Camino. For more information, call Christina Bastien at 283-9300.

**Cafeteria menu** — Special: stuffed cabbage. Entrees: turkey and dressing, round steak with hash browns. Soup: beef and barley. Vegetables: corn cobbette, okra and tomatoes, French beans.

## Wednesday

**TQM seminar** — A TQM Brown Bag Seminar focusing on "Creating the Structure for Successful Continuous Improvement Teams" will be at noon March 17 in Bldg. 12, Rms. 254 and 256. Sherry Prud'homme of Lockheed will speak. For more information, call Roberta Beckman at x38525.

**Astronomy seminar** — The JSC Astronomy Seminar will meet at noon March 17 in Bldg. 31, Rm. 129. Jim Oberg will discuss "Fast Terra-Forming of Mars." For more information, call Al Jackson at 333-7679.

**Cafeteria menu** — St. Patrick's Day Special: Corned beef, cabbage, parsley potatoes. Entrees: catfish with hush puppies, roast pork with dressing. Soup: seafood gumbo. Vegetables: broccoli, macaroni and cheese, stewed tomatoes.

## Thursday

**Cafeteria menu** — Special: chicken fried steak. Entrees: beef tacos, barbecue ham steak, Hungarian goulash. Soup: turkey and vegetable. Vegetables: spinach, pinto beans, beets.

## Friday

**UNIX group meets** — The JSC UNIX Systems Administration Group will meet at 2 p.m. March 19 in Bldg. 12, Rm. 254/256. Jim Molini will discuss "Computer Security Incident Handling." For more information, call Mark Hutchinson at x30738.

**Cafeteria menu** — Special: tuna and noodle casserole. Entrees: liver and onions, deviled crabs, roast beef with dressing. Soup: seafood gumbo. Vegetables: whipped pota-

toes, peas, cauliflower.

## Monday

**Cafeteria menu** — Special: breaded cutlet. Entrees: beef chop suey, Polish sausage with potato salad. Soup: French onion. Vegetables: okra and tomatoes, green peas.

## March 22

**Lunch and learn** — The American Institute of Aeronautics and Astronautics' Communications and Tracking and Technical Committee and the Institute of Electrical and Electronics Engineers' Communication Society Chapter will host a joint technical meeting at 11:30 a.m. March 22 in the Gilruth Center. Dr. George D. Arndt, chief of JSC's Electromagnetic Systems Branch, will discuss "High Temperature Superconducting Applications in Space." For more information, call Kumar Krishen at 283-5875, or Y.C. Loh at 333-6725.

**Lunch and learn** — The American Institute of Aeronautics and Astronautics' Materials, Structures and Dynamics Technical Committee will meet at 11:30 a.m. March 22 in Lockheed Plaza 1, Rm. 12C. The SAFER Team will discuss various aspects of its design. For more information, call Gillian Shepherd at 333-6239 or Don Probe at 333-6278.

## March 24

**Astronomy seminar** — The JSC Astronomy Seminar will feature an open discussion meeting at noon March 24 in Bldg. 31, Rm. 129. For more information, call Al Jackson at 333-7679.

## Boats & Planes

'82 20' Bayliner 20070, 120 hp I/O, 10 hp Honda, full cabin, Furuno, Sportsman trlr, \$5K OBO. 286-3981.

Stainless propeller for Johnson O/B, 13.5 OD x 17 pitch, \$100. Andy, 332-9105.

'18' Sailable canoe w/sail, flexible ARS shell, mountable on top of car, \$450. Minh, x30992 or 484-2456.

'18' CC Searay, 135 Merc 50 hrs, SSP, alum P, 3D hum, VHF, bimini, full instr, console cover, \$16K OBO. Scott, x49854 or 554-6167.

## Cycles

'88 Honda Hurricane, 18K mi, \$3K. x34204 or 480-2954.

Trek 360, 12 spd, accessories, ex cond, \$275 OBO. Daryle, 282-4283 or 286-9218.

## Audiovisual & Computers

Brothers wordprocessing elec typewriter, 12K character, memory w/unlimited files, auto fonts, formatting, 40 character display, spellcheck, \$200. Beth, x33078.

Panasonic printer, incl 6 multicolored ribbons, ex cond, \$75. Dave, 333-4852.

Mitsubishi stereo, 100 w amp/rf, tuner, graphic equalizer, dual cass tape deck, \$250 OBO. x35786 or 482-9263.

Microsoft Access, v1.0, Reactional database sw for PC/Windows, unregistered. Laura Pusck, x34320.

Amiga A2000HD, 1 MB RAM, 40 MB Quantum HD, \$1K; 2 MB mem board, \$100; XT BridgeCard, \$250; AMAX II, MAC emulator w/Mac ROMs, \$250; 14" SuperSync monitor, \$250; PC 1.44M FD, \$100; Mac 800M disk drive, Amiga 5-1/4" disk drive, \$25; Taurus sw, \$50; Aegis Draw Plus, \$20; EA deluxe video sw, \$20. Mark, 929-7215.

Nintendo game sys, 5 games, light gun, 5 Nintendo magazines, was \$260, now \$125; Gameboy w/3 games, \$100. Don, 244-4666 or 486-6726.

Epson FX-80 printer, \$75; Tandy DWP220 printer, daisy wheel, \$25; 2 boxes tractor feed paper, \$20. Stacey, x32649 or Jim, 480-9793.

AT&T 6300, 30 MHD, nono, manuals sw on #D L123, PW, Xtree, Print Master, \$425. x47533 or 337-4051.

Stereo, custom teak cabinet, amp, toner, turntable, 15" spkrs, \$450. 488-8493.

Nintendo master sys, 2 controllers, red light gun, 4 games, papers, warr sheets, no marks, \$100. 488-7343.

Seiko CM1450, 14', .25 mm dp, 1024 x 768, noninterlaced M/S monitor, \$550; C64C/1541C, \$250; C64, \$75; C64 sw, best offer; Sharp XT laptop, 2 x DDFD, CGA, case, \$550. Jesse, 332-6681 or 996-9641.

PC game sw, Blue Max, \$15; Perils of Rosella, \$15; Where in time is Carmen San Diego, \$15; Lesure Suit Larry-I, \$10; PC sw, MS-Fortran 5.1 Prog Dev Sys, \$200; Turbo C++ Prof, \$100; MS Word 5, \$50; Geoworks Ensemble 1.2, \$30; PC Tools 6.0, \$40; Sprint 1.0/Bonus Pack, \$50. x35442 or 992-2304.

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Free green-eyed, orange, long haired tabby, female, less than 1 yr old, spayed/ shots. 489-9677.

Free, 5 yr old calico, indoor/outdoor, spayed/shots. Dick, x33161 or 481-1518.

## Musical Instruments

Yamaha classical guitar, 3 yr old, was \$450, now \$200. 332-1725.

Upright piano, \$500 OBO. Jan, 244-7898 or 488-8466.

5 pc drum set, 24" bass, 13", 14", 18" toms, 2 rottoms, stands, case, fibes, blk, \$350. 482-6991.

## Household

Daybed w/pop-up trundle, \$100; solid wood console tv, pecan finish, 43 w x 19 d x 30 h, tv needs work, \$50. 532-1175.

Sofa, chair w/ottoman, earth tone colors, \$150. x31913 or 486-9488.

DR wood tbl w/6 uphol chairs, seats 6, southwest design, \$400. 333-7131 or 334-1009.

5 pc dinette set, butcher block, natural finish, \$225; contemp sofa/love-seat, \$325; cherry wood coffee tbl, \$50; end tbl, \$1

# Pushing the Right Buttons

## Solar System Exploration lab's certification program increases researchers' ability

By Jerry Wagstaff and Audrey Schwartz

**W**hen Abhijit Basu, a visiting scientist from Indiana University, first encountered the complex Scanning-Transmission Electron Microscope in Bldg. 31 he felt much like he did when he drove in Great Britain for the first time — down the “wrong” side of the street.

Now, the scientists in the Solar System Exploration Division laboratories have developed a “drivers education” course of sorts to help train and certify Basu and other researchers to use JSC's sophisticated precision electron microscopic instruments.

Each year numerous visiting researchers from around the world come to analyze cosmic dust particles, meteorites, lunar samples, orbital debris and other types of exotic material in the division's laboratory complex, which houses some of the world's cutting edge microscopy equipment. “The laboratory staff found we were spending too much time helping people who didn't know what buttons to push,” said Sue Wentworth, a Lockheed senior scientist who helped develop a training and certification program for equipment users.

“Most people asked for help, although some did go and try to work the equipment they thought they knew on their own. The result was a lot of problems with the equipment caused by people who didn't know what to do or how the equipment worked.”

Wentworth and her colleagues found their own productivity hampered as they tried to help other researchers, both inside and outside NASA. In addition, down time of equipment, caused in large part by misuse, interrupted their research schedules. Two years ago, a team consisting of Lockheed scientists Wentworth, Ruth Barrett, Kathie Thomas-Keprta, Ronnie Bernhard and Jerry Wagstaff decided that a rigorous, formal user certification program would be the first step in improving productivity in the lab complex, and received the green light from Dr. David McKay, the NASA technical monitor.

“In some areas of micro-analysis our labs are perhaps the best in the country. Part of our job is to support outside scientific work. By being able to train and certify researchers and students to use the labs' equipment more effectively, we didn't have to do the work for them, we become confident they will produce the right results, and we better fulfill our mission to outside customers,” said McKay,

assistant chief of the division for exploration.

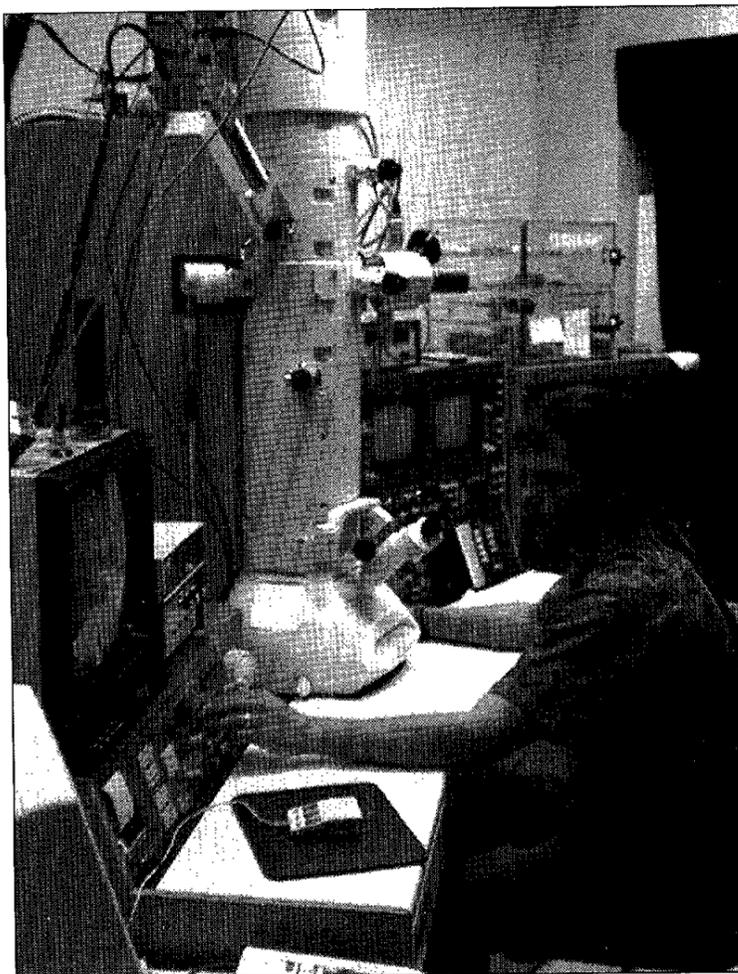
The certification program helps users more fully understand the capabilities of the equipment and learn how to operate the equipment on their own, thus freeing staff scientists to concentrate on basic research for division projects.

“What really worked was the administration of the competency test at the end of training to assure us that users really knew what they were doing, rather than just give training and let them go ahead,” said Wagstaff, scientific supervisor. “After users are done with training and we are convinced they can operate the equipment in a consistent manner, we give them a certificate. I even had to get one.”

Researchers can receive up to five separate certifications on the lab complex's two Scanning Electron Microscopes, two Scanning-Transmission Electron Microscopes and the ultramicrotome. The SEMs are highly complex precision instruments capable of imaging submicron images of samples and the STEMs is capable of imaging the molecular lattice of many materials. All microscopes are equipped with Energy Dispersive X-ray Spectrometers which provide qualitative and quantitative chemical analysis of the features being examined. The ultramicrotome cuts samples into sections thinner than a wavelength of light in preparation for transmission electron microscopy.

“I was surprised that I had to go through a certification program to use the equipment. I felt the certification was just a kind of bureaucracy that I didn't associate with my early experiences at NASA,” said Indiana University scientist Basu who is studying lunar regolith during a sabbatical at the Lunar and Planetary Institute. “Now, I'm a lot more thorough. If I had learned by using this equipment by myself I would have only learned what I needed on a short-term basis. Now I find I can do more because I am more cognizant of the possibilities than I would have been otherwise.”

The team met with users to understand their training needs and had them critique the process. A big problem the team uncovered was the lack of industry standardization for the use of any electron microscope. Switches on different models of SEMs often turned in different directions, which could lead to breakage if the uninitiated turned the device



Left: Ron Bernard uses a High Resolution Transmission Electron Microscope, one of the tools used by Solar System Exploration Division scientists and visiting scientists to analyze cosmic dust particles, meteorites, lunar samples, orbital debris and other exotic materials. Bernard is one member of a division Total Quality team that has developed a training program to help visiting scientists learn how to use the equipment properly. Bottom left: Sue Wentworth, seated, and Ruth Barrett look at a Scanning Electron Microscope's view of a meteorite—possibly from Mars—in the division's laboratory. Bottom right: The team that put together the training course for visiting researchers included, from left: Kathie Thomas-Keprta, Ruth Barrett, Sue Wentworth, David McKay and Ron Bernhard.

JSC Photos by Jack Jacob

Since the certification program began in January 1991 about 52 NASA and contractor scientists, visiting U.S. and international researchers, National Research Council post doctoral fellows and local university faculty and students have been certified on the instruments.

The team used past instrument log books of equipment utilization time as a metric of success. They hoped that equipment utilization hours would increase each month as more users were certified. By the end of the second quarter of 1991, the most heavily used instrument, the JEOL 35CF, demonstrated a 74 percent increase in utilization compared to the same period the previous year, and utilization jumped 368 percent in the third quarter of 1991. While the equipment utilization level varies depending on customer demands, according to Jerry Wagstaff, the lab complex has sustained its productivity level even though the number of trainees is not as dramatic as during the initial implementation.

“In addition to increasing equipment utilization, our customers now have an improved understanding of the capabilities and limitations of the laboratory equipment,” he said. “Although it is difficult to quantify, we believe that this improved understanding has led to improvements in the quality of our customer's work.”

The productivity of the lab's staff has improved as well, despite the time required for training new users. “Staff scientists Ronnie, Ruth, Kathie and Sue were able to utilize the additional time they gained from not having to assist so many customers to perform more research for SN projects. In fact, the number of publications that this group assisted with, either as senior author or co-author on an abstract or journal article, more than doubled to 36 in the last year,” Wagstaff said.

An unexpected result of the program has been the satisfaction felt by those completing certification, both in and outside of JSC. “People are proud of that certificate. Many outside users include their SN certification in their resume and graduate school applications because they feel it gives them an advantage,” McKay stated. “The team spirit of our staff has increased because of the program. By going through rigorous training and getting that certificate, the staff feels we have an organization that sets high standards.” □

“During the final exam, we come in and mess everything up — turn switches and dials to all the wrong settings — and they need to realign and fix it up to pass. Not everyone makes certification the first time out, but they pass after the second try,” Thomas-Keprta stated.

However, the competency training is time consuming, especially during the initial two-year start-up of the program. Some of the division's lab staff were hesitant at first that the time investment would be worth it. “My work load has increased tremendously. I'm putting in more hours than I ever have,” said Ruth Barrett, the principle instructor. “But it has been worth it for everybody. The biggest trouble the lab had was the lack of good training. Once people are trained, they require no additional help unless a problem comes up. There's not much operator error and that saves money in the long run, and in the research business time is money.”



# Goldin: trade short-term pain for long-term gain

(Continued from Page 1)

throw off any beliefs that they are entitled to a particular kind of space program or that the program belongs solely to NASA, NASA contractors or university researchers. Deluxe, multidecade programs cannot be justified under an umbrella of geopolitical necessity any longer, he said.

"Now is the time to give the second and third-generation NASA employees and all the people in the aerospace community their chance for their own golden age, and we cannot do that on our present course. We are going to have to accept and embrace the challenge of change."

The space station program is a case in point, he said. It represents a lot of hard work by a lot of dedicated people, but in the end it is simply too expensive. Continuing it would

have meant gutting many other important programs, threatening to wash away the other meaningful things the country and the agency need to do.

President Clinton wants NASA to move ahead with a less expensive space station design that builds on the excellent work that has been done and that minimizes the pain of transition, but that reduces the development costs of the station and lowers the long-term operation cost.

"We trade short-term pain for long-term gain," Goldin said. "He has placed us in charge of our own destiny. It is up to us."

"We could fight with each other, we could make fancy view graphs, we could have leather briefcases, we could have patent leather shoes, we could go rolling up to the Hill, we could make a lot of promises, we

could get other programs canceled, we could destroy careers," he added. "If you wear your corporate hat, your center hat, if you wear a truss hat, if you wear a hat that has your personal identification and ego on it, you will destroy what we have. You'd better put on a baseball cap that says the United States of America or we're not going to have a coherent space program."

Clinton wants NASA to play an important role in the renewal of America's technological base, Goldin said, and as one of the government's premiere research and development agencies NASA has key skills and facilities that can be brought to bear. Clinton faced a paradox of needing to provide resources to renew the country's aeronautics industry and expand

technology development while preserving NASA's core program of exploration and meaningful science while significantly reducing the rate of growth of NASA's budget over the next five years.

"Change is never easy, but I believe this new direction from the White House is both reasonable and far-sighted and it will provide NASA with a rich and promising future," he said.

"It's an agency that was born at the height of the Cold War as a means to protect national prestige into the new ocean of space," Goldin said. "We did that, and we did that very, very well. We sent people into space, and we landed on the Moon. We completed humanity's first reconnaissance of the solar system and the universe."

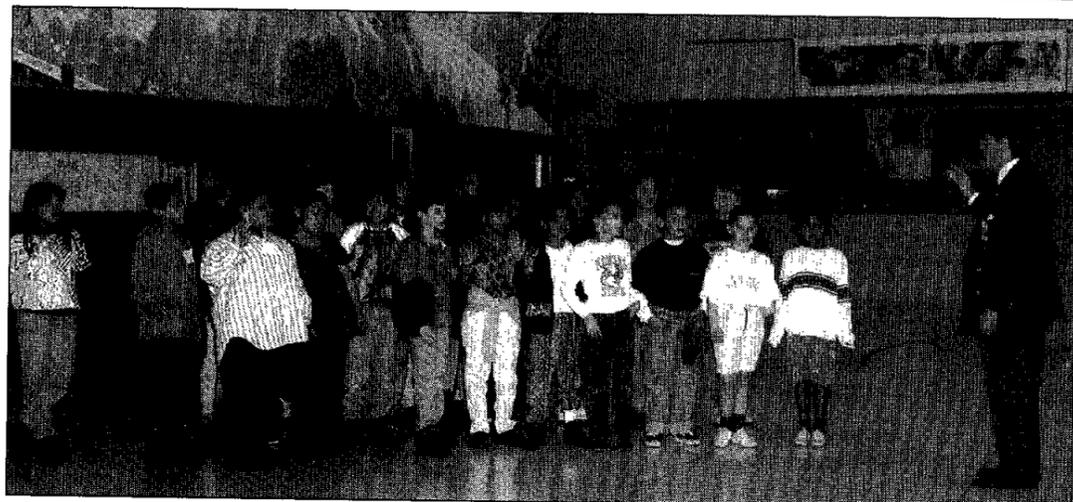
"Now that the currents of history

have swept us into a new age, the role we have played and the investments we have made must involve new places. NASA cannot survive as a relic of bygone days."

The agency cannot achieve its new goals by hanging onto the past or setting goals that simply reinvent Apollo, Goldin said.

"We have to become relevant to the post-Cold War world," he said. "We should salute Apollo. We should learn from the triumphs of Apollo. We should be grateful for the lessons and glory it gave us, but now we must move beyond those memories, transcend those past days and seek a higher order of achievement."

"I personally am tired of Apollo stories. I want us to start writing history, not reading and talking about it," Goldin said.



JSC Photo by Robert Markowitz

**SENDING A HELLO**—JSC Education Programs Officer Bob Fitzmaurice rehearses a group of area students for a good morning message from JSC to be broadcast as part of the JASON Project, an interactive educational adventure that linked the students with research studying thermal vents off Mexico's Baja coast. The students, from Braeburn Elementary in Houston and Harlem Elementary in Baytown, were among an estimated 10,000 that made contact with the undersea researchers from Teague Auditorium.

## Healthy People 2000'

# Fitness challenge aims to improve JSC fitness levels

By Audrey Schwartz

JSC will participate in a national fitness program that seeks to get couch potatoes away from their TV remote controls and out cycling, jogging, walking or engaging in other regular exercise that can result in better health and lower medical costs.

"Healthy People 2000," sponsored by the Department of Health and Human Services, aims at improving American health as the country enters the next century. Currently, only 22 percent of the U.S. population engages in light-to-moderate exercise regularly. The "Healthy People 2000" goal is to have at least 30 percent of all Americans in an exercise routine by the end of the decade.

NASA employees are encouraged to participate in this program through an agencywide friendly sports-related competition called "The NASA Fitness Challenge" running now through Aug. 31. The NASA Center with the highest percentage of civil servants and civil service retirees qualifying will be the winner. Special awards also will be given for total civil service, contractor and family participation, and in individual sports categories.

This third annual sports challenge is based on the Presidential Sports Award requirements. Competitors must, within a four consecutive month period, exercise in one or a combination of 67 different events prescribed by the award rules and keep a detailed log book. Eligible activities include traditional jogging, walking, golf, tennis, rowing, softball, weightlifting, aerobics, and water skiing to roller blading, martial arts, scuba diving, canoeing, cheer leading and Frisbee throwing. The most popular competitive area

is the sports/fitness category which allows a combination of 50 total hours in almost any activity.

"The requirements are not easy," said Larry Wier, director of the JSC Health Related Fitness Program. "After all, the purpose of this wellness program is to improve health, not to try to push competition or recreation. We aren't trying to have compulsive exercisers out for an annual goal. Health care costs are a national concern. If you're well, you don't get sick and if you don't get sick, it doesn't cost as much," Wier notes.

Unfortunately, in past intercenter challenges, JSC performance has been rather "sickly." Ames-Dryden won last year and Marshall won the year before, while JSC placed fourth both times. "Only four percent of JSC civil servants returned challenge log books in 1991 and less than half that returned logs last year. Though there are lots of JSC people exercising, very few complete and turn in the logs," Wier said.

However, JSC did boast a major award winner last year. James Bodmer, a JSC retiree who worked in the Mission Operations Directorate, set the all-NASA record by earning 12 special awards. Bodmer spent three hours a day in aerobic exercises including rowing, stair master, speed walking, weight training, and long-trail hiking. "It was such an effective workout that I could eventually exercise seven days a week and not feel it. The biggest mistake I made was not following through with it all year," Bodmer admitted.

JSC employees, retirees and contractors wanting to participate in the NASA Fitness Challenge should contact Larry Wier in the Gilruth Center, Mail Code AW9. Deadline for log book completion is Aug. 31.

## Sponsors sought for Management Experience Day

The JSC chapter of the National Management Association is seeking sponsors for its sixth annual Management Experience Day scheduled for April 21.

The chapter will host 24 seniors and six teachers from high schools throughout the Houston area. Each student and teacher will be paired with a manager for the afternoon to observe the type of management work conducted at JSC.

"Management Experience Day offers students and teachers an opportunity to gain first-hand experience of managers' daily activities at JSC. We plan to match students and teachers with JSC managers according to specific fields of interest while providing exposure to management within a Federal agency. We hope this will encourage students to pursue management fields in the future," said

Richard Regenburgh III, JSC-NMA chapter president.

"We hope teachers will carry their experience back to the classroom and share this information with other students."

JSC managers interested in hosting a student or teacher for Management Experience Day should contact Debbie Denton at x33038 or Natalie Saiz at 33035 no later than Friday.

## Cohen sees abundance of work for JSC

(Continued from Page 1)

agency maintain its credibility is the Space Shuttle Program, which has done an excellent job of performing while reducing costs, Cohen said. But even that program is not immune to criticism as demonstrated by recent congressional hearings on cost overruns associated with the improved shuttle waste collection system.

The Space Shuttle Program will continue to receive congressional

support, he predicted, but with more emphasis on extended duration operations and life sciences research.

The program that can help NASA regain its credibility with Congress is space station, he said, and noted that teams now reviewing restructuring options are expected to complete their initial reviews in 90 days.

The space program also must expand its technology utilization efforts to develop dual-use technolo-

gies that can help provide economic stimulus for the country, Cohen said. NASA scientists and engineers must begin thinking about industrial applications for their developments as part of their everyday work in an effort to share the benefits with the American people.

Cohen said that no matter what changes are in store for the agency and its programs, he is sure there will be an abundance of work for JSC employees.

## Crews named for two 1994 shuttle flights

(Continued from Page 1)

munities to test space-based processes for beneficial applications here on Earth.

Air Force Col. Sidney M. Gutierrez will command the STS-59 Space Radar Laboratory mission aboard *Atlantis*. Other crew members are Air Force Col. Kevin P. Chilton as pilot and Jay Apt, Ph.D., and Army Lt. Col. Michael R. "Rich" Clifford, as mission specialists. Previously announced crew members are Linda M. Godwin, Ph.D., named payload commander in August 1991 and Thomas D. Jones, Ph.D., named mission specialist in February 1992.

The Space Radar Laboratory, STS-59, will take radar images of the Earth's surface for Earth sys-

tem sciences studies including geology, geography, hydrology, oceanography, agronomy and botany; gather data for future radar system design including the Earth Observing System, and take measurements of the global distribution of carbon dioxide in the troposphere.

Casper, 49, of Gainesville, Ga., commanded STS-54 in January 1993 and was pilot on STS-36 in February 1990.

Allen, 37, of Philadelphia, was pilot on STS-46 in July 1992.

Thuot, 37, of Fairfax, Va., and New Bedford, Mass., was mission specialist on STS-36 in February 1990 and STS-49 in May 1992.

Gemar, 37, of Scotland, S.D., was a mission specialist on STS-38

in November 1990, and STS-48 in September 1991.

Ivins, 41, of Baltimore, was mission specialist on STS-32 in January 1990 and STS-46 this year.

Gutierrez, 41, of Albuquerque, was pilot on STS-40 in June 1991.

Chilton, 38, of Los Angeles, was pilot on STS-49.

Apt, 43, of Pittsburgh, was mission specialist on STS-37 in April 1991 and STS-47.

Clifford, 40, of Ogden, Utah, flew as a mission specialist on STS-53 in December 1992, a DOD flight, during which Clifford operated a fluid transfer experiment and a laser detector to acquire transmissions from low-power Earth-based lasers.

## Space News Roundup

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Editor ..... Kelly Humphries  
Associate Editor ..... Kari Fluegel

## Jemison leaving NASA to teach

(Continued from Page 1)

work and training to use for the good of others."

Jemison, 36, was selected for the astronaut program in June 1987. She was a science mission specialist on STS-47, Spacelab-J, in September 1992, a cooperative mission with the Japanese to study life sciences and materials processing. Jemison was a co-investigator on the bone cell research experiment flown on that mission.

## Correction

An article in the March 8 Space News Roundup incorrectly identified Bob Savely. He is ISD chief scientist, advanced software technology.